The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Remanded 4-7-04 V.S.H.

Ex parte EDWIN PETER DAWSON PEDNAULT

Appeal No. 2002-0308
Application No. 09/106,784

ON BRIEF

Before KRASS, DIXON and SAADAT, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-20.

The invention is directed to a method for constructing predictive models that can be used to make predictions in situations where the inputs to those models can have values that are missing or otherwise unknown.

A copy of Independent claim 1 is appended to this decision.

No references are relied on.

Claims 1-20 stand rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter because the claims describe an "abstract" idea.

Reference is made to the brief and answer for the respective positions of appellant and the examiner.

OPINION

It is the examiner's position that the instant claimed invention "lacks a practical application providing a useful, concrete, and tangible result because it is directed to an abstract idea. The claimed invention receives abstract input data, performs mathematical operations, and outputs abstract data" (answer-page 11).

Appellant, naturally, takes the opposite view, contending that the instant claimed "invention constitutes a practical application of mathematical principles to achieve a useful, concrete, and tangible result," that the invention "is not restricted to specific applications," and that predictive "modeling technology, in general, and Appellant's invention, in particular, are useful in a very wide range of applications" (brief-page 23)

We begin our inquiry, as we must, with the specific claims before us. Independent claim 1 makes it very clear that we are dealing with a structure, a "program storage device" that is readable by a machine. Thus, we are not dealing with an "abstract" idea existing only in one's mind. Further, the claimed subject matter is directed to the computer program that is executed by the machine in order to perform

specific method steps. Accordingly, we are dealing with a computer-implemented process that is run on a machine. Machines and processes comprise, prima facie, statutory subject matter as they are specifically mentioned in 35 U.S.C. §101 as classes of invention which are patentable.

The process, or method, of the instant invention is a mathematical algorithm. While a long line of cases affirm the concept that a claim directed to a mathematical algorithm is a nonstatutory class of invention and is not included under 35 U.S.C. §101, a "claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program or digital computer." Diamond v. Diehr, 450 U.S. 175, 187, 209 USPQ 1, 8 (1981). The question is whether there is a practical application of this mathematical algorithm that achieves a useful, concrete, and tangible result or whether the algorithm merely results in an abstract number.

In the instant claimed invention, a collection of training data is collected, wherein the training data are input values that are available to a model, together with desired output values that the model is to predict. Then, a plurality of subordiniate models are generated, these subordinate models together comprising an overall model. Finally, a specification of at least one of the subordinate models generated is output and a prediction is generated based on the at least one of the subordinate models generated.

While the specification addresses a specific application of this algorithm, i.e., used in a direct-mail targeted-marketing purpose (e.g., page 1), the instant claims are related to a more general application of the algorithm, i.e., making a prediction with a predictive model even when the values of some or all of the inputs are unknown. Such a method may have application in many areas, but it does have practical application. The mathematical algorithm manipulates numbers in order to make a predictive model that is then used to make predictions. Reference to the instant specification, at page 1, indicates, as an example of the useful, concrete and tangible result of the algorithm, that a predictive model may be used "to optimize return on marketing investment by ranking consumers according to their predicted responses to promotions, and then mailing promotional materials only to those consumers who are most likely to respond and generate revenue." Thus, we cannot agree with the examiner's assessment that the instant claimed subject matter is, somehow, merely an "abstract idea failing to recite a practical application having useful, concrete, and tangible result" (answer-page 3).

While a mathematical algorithm is clearly involved in the instant claimed subject matter, we find that the claimed subject matter as a whole is directed to a combination of computer-implemented steps which, when executed by the claimed machine, allows for a predictive model which can make a prediction even without knowing all of the values of the inputs. This is not a disembodied mathematical concept which may be

characterized as an "abstract idea," but rather a specific machine to produce a useful, concrete, and tangible result. In re Alappat, 33 F.3d 1526, 1544, 31 USPQ2d 1545, 1557 (Fed. Cir. 1994).

Thus, to whatever extent the instant claimed subject matter constitutes a mathematical algorithm, it recites a practical application of a mathematical algorithm and such subject matter falls comfortably within the broad scope of patentable subject matter under 35 U.S.C. §101. AT&T Corp. V. Excel Communications, Inc., 172 F.3d 1352, 1355-56, 50 USPQ2d 1447,1450 (Fed. Cir. 1999).

The examiner's decision rejecting claims 1-20 under 35 U.S.C. §101 is reversed.

REVERSED

ERROL A. KRASS)
Administrative Patent Judge)
)
)
) BOARD OF PATENT
JOSEPH L. DIXON) APPEALS
Administrative Patent Judge) AND
) INTERFERENCES
)
)
MAHSHID D. SAADAT)
Administrative Patent Judge)

EAK/vsh

Appeal No. 2002-0308
Application No. 09/106,784

~~FRED GIBB~~
~~McGINN & GIBB, PC~~
~~1701 CLARENDON BOULEVARD~~
~~SUITE 100~~
~~ARLINGTON, VA 22209~~

MCGINN & GIBB, PLLC
8321 OLD COURTHOUSE ROAD
SUITE 200
VIENNA, VA 22182-3817

APPENDIX
Claim 1

1. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for constructing a predictive model that can be used to make predictions even when the values of some or all inputs are missing or are otherwise unknown, the method comprising:

(1) presenting a collection of training data comprising examples of input values that are available to the model together with corresponding desired output value(s) that the model is intended to predict;

(2) generating a plurality of subordinate models, that together comprise an overall model, in such a way that:

a) each subordinate model has an associated set of application conditions that must be satisfied in order to apply the subordinate model when making predictions, the application conditions comprising:

i) tests for missing values for all, some, or none of the inputs,

and

ii) tests on the values of all, some, or none of the inputs that are applicable when the values of the inputs mentioned in the tests have known values;

and

APPENDIX
cont.

b) for at least one subordinate model, the training cases used in the construction of that subordinate model include some cases that indirectly satisfy the application conditions such that the application conditions are satisfied only after replacing one or more known data values in these training cases with missing values; and

3) outputting a specification of at least one of said subordinate models thus generated and making a prediction based on said at least one of said subordinate models thus-generated.